



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

| | |
|----------------------------|--|
| Manufacturer | MANULI RYCO Hydraulics Sdn. Bhd. |
| Address | Plot 207, Kuala Ketil Industrial Estate, Kuala Ketil, Kedah, 09300, Malaysia |
| Place of Production | MANULI RYCO Hydraulics Sdn. Bhd. Plot 207, Kuala Ketil Industrial Estate, Kuala Ketil, Kedah, 09300, Malaysia |
| Place of Production | Manuli Ryco Hydraulics (Dalian) Co., Ltd. 38 Ying Ri Road, Ying Cheng Zi Industrial Zone, Gan Jing Zi District, Dalian, Liaoning, 116036, China |
| Place of Production | Manuli Hydraulics (Suzhou) Co.,Ltd. No. 85, Xinglin Street, Suzhou Industrial Park, Suzhou, Jiangsu, 215021, China |
| Type | Flexible Pipe Couplings And Hoses |
| Description | Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings Designations: Diehard T1D Slider T1S Survivor RQP1 DF1D Diehard DF1S Slider DK1D Diehard DK1S Slider |



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Fire Suppression T1F

Trade Name

SAE100R1

Application

For use on ships and offshore installations classed with Lloyd's Register, as short lengths in systems of fresh and seawater, compressed air, water based hydraulics, hydraulic oil, fuel and lubricating oil.

Specified Standard

Part 5, Chapter 12 of Lloyd's Register's Rules and Regulations for the Classification of Ships (July,2013)
Part 5, Chapter 10 of Lloyd's Register's Rules and Regulations for the Classification of Mobile Offshore Units (September 1996 plus Notices Nos. 1, 2, 3, 4, 5 & 6 as applicable)
Fire Resistant Testing according to ISO 15540/15541

Ratings

Type: SAE100R1
Sizes: DN 5 to DN 51
Maximum Working Pressure: 40 to 250 bar (refer to appendix)
Service Temperature: -40°C to +150°C (refer to appendix)
Coupling Material: Carbon Steel AISI Stainless Steel (Option) and Electroplated Fe/Zn12c acc. to AS1789

Other Conditions

Where synthetic rubber hoses are used for oil fuel supply to burners, the hoses are to have external wire braid protection in addition to the integral wire braid. Carbon steel couplings are to be normalized for temperatures below -10°C. In all cases the hoses are to be installed in accordance with the manufacturer's



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instructions and tested to the satisfaction of the attending

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register Singapore Pte Ltd of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document SEATASS230 and its supplementary Type Approval Terms and Conditions form part of this Certificate.



Appendix

RATINGS

| DIEHARD T1D | DN (mm) | Max. Pressure (bar) |
|------------------------------------|---------|---------------------|
| T13D | 5 | 250 |
| T14D | 6 | 225 |
| T15D | 8 | 215 |
| T16D | 10 | 180 |
| T18D | 12 | 160 |
| T110D | 16 | 130 |
| T112D | 19 | 105 |
| T116D | 25 | 90 |
| T120D | 31 | 65 |
| T124D | 38 | 50 |
| T132D | 51 | 40 |
| Temperature Range: -40°C to +100°C | | |
| SLIDER T1S | DN (mm) | Max. Pressure (bar) |
| T13S | 5 | 250 |
| T14S | 6 | 225 |
| T15S | 8 | 215 |
| T16S | 10 | 180 |
| T18S | 12 | 160 |
| T110S | 16 | 130 |
| T112S | 19 | 105 |
| T116S | 25 | 90 |
| T120S | 31 | 65 |
| T124S | 38 | 50 |
| T132S | 51 | 40 |
| Temperature Range: -40°C to +100°C | | |
| SURVIVOR RQP1 | DN (mm) | Max. Pressure (bar) |
| RQP14 | 6 | 225 |
| RQP15 | 8 | 215 |
| RQP16 | 10 | 180 |
| RQP18 | 12 | 160 |
| RQP110 | 16 | 130 |
| RQP112 | 19 | 120 |
| RQP116 | 25 | 90 |
| Temperature Range: -40°C to +150°C | | |

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| DF1D DIEHARD | DN (mm) | Max. Pressure (bar) |
|------------------------------------|---------|---------------------|
| DF14D | 6 | 225 |
| DF15D | 8 | 215 |
| DF16D | 10 | 180 |
| DF18D | 12 | 160 |
| DF110D | 16 | 130 |
| DF112D | 19 | 105 |
| DF116D | 25 | 90 |
| Temperature Range: -40°C to +100°C | | |

| DF1S SLIDER | DN (mm) | Max. Pressure (bar) |
|------------------------------------|---------|---------------------|
| DF14D | 6 | 225 |
| DF15D | 8 | 215 |
| DF16D | 10 | 180 |
| DF18D | 12 | 160 |
| DF110D | 16 | 130 |
| DF112D | 19 | 105 |
| DF116D | 25 | 90 |
| Temperature Range: -40°C to +100°C | | |

*Part No., Dimension and rated Pressure are in accordance with the information provided in the product datasheet for DF1D.

| DK1D DIEHARD | DN (mm) | Max. Pressure (bar) |
|------------------------------------|---------|---------------------|
| DK14D | 6 | 295 |
| DK15D | 8 | 250 |
| DK16D | 10 | 230 |
| DK18D | 12 | 200 |
| DK110D | 16 | 150 |
| DK112D | 19 | 125 |
| DK116D | 25 | 110 |
| DK120D | 31 | 100 |
| Temperature Range: -40°C to +100°C | | |

| DK1S SLIDER | DN (mm) | Max. Pressure (bar) |
|-------------|---------|---------------------|
| DK14S | 6 | 295 |
| DK15S | 8 | 250 |
| DK16S | 10 | 230 |
| DK18S | 12 | 200 |
| DK110S | 16 | 150 |



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|------------------------------------|----|-----|
| DK112S | 19 | 125 |
| DK116S | 25 | 110 |
| DK120S | 31 | 100 |
| Temperature Range: -40°C to +100°C | | |

| FIRE SUPPRESSION T1F | DN (mm) | Max. Pressure (bar) |
|------------------------------------|---------|------------------------|
| T13F | 5 | 250 |
| T14F | 6 | 225 |
| T15F | 8 | 215 |
| T16F | 10 | 180 |
| T18F | 12 | 160 |
| T110F | 16 | 130 |
| T112F | 19 | 105 |
| T116F | 25 | 90 |
| Temperature Range: -40°C to +100°C | | |

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